

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1-3, 9-13 and 17-24 are currently being prosecuted. The Examiner is respectively requested to reconsider his rejections in view of the amendments and remarks as set forth below.

Allowable Subject Matter

It is greatly acknowledged that the Examiner considers the subject matter of claims 3 and 10 as being allowable.

Rejections under 35 U.S.C. § 103

Claims 1, 2, 5, 6 and 9 stand rejected under 35 U.S.C. § 103 as being obvious over Takeuchi (U.S. Patent 5,389,571) in view of Nishizawa et al. (U.S. Patent 5,338,389). Likewise, claims 7, 8 and 11-16 stand rejected under 35 U.S.C. § 103 as being obvious over the same two references. These rejections are respectfully traversed.

The Examiner points out that Takeuchi et al. teaches a light emitting device having a layered structure made by deposition techniques. The emitting layer contains a dopant and is a Group III-V compound semiconductor. The Examiner admits that Takeuchi does not teach the method used to create the device as presently claimed. The Examiner relies on Nishizawa to teach the use of pulse chemical vapor deposition. The Examiner points out that the source can be metal organic compounds. The Examiner feels it would have been obvious to modify the

Takeuchi et al device using the teachings of Nishizawa et al to grow layers by pulse deposition in order to increase the control over the layer composition and thickness. The Examiner also points out that Nishizawa teaches two dopants Mg and Si and it would be obvious to modify the Takeuchi device to use the two dopants.

By way of the present amendment, Applicants have amended the claims to clearly overcome the art rejections. Claim 1 has now been amended to make clear the times of the starting supplies of the various materials. In particular the p-type impurity raw material is supplied at the same time or after starting the supply of two of the three types of crystal raw materials and before starting the supply of the other types of crystal raw material where all three types of crystal raw materials are supplied once.

In the Nishizawa reference, Ga, Al, As and a dopant gas are supplied at different periods in one cycle in which all three types of crystal raw materials are supplied once each. In particular, Nishizawa supplies the impurity dopant gas in a different period from the period for supplying the three types of crystal raw materials. Takeuchi, does not even mention the supply periods for the impurity dopant gas and the three types of crystal raw materials. In view of this, Applicants submit that claim 1 clearly is not obvious over this combination of references.

Claim 2 depends from claim 1 and as such is also considered to be allowable.

The Examiner has already indicated that claim 3 is allowable.

Claims 5 and 6 likewise supply the various materials at certain times and are also allowable for the same reasons recited above with regard to claim 1.

Claims 7 and 8 depend from claim 6 and as such are also considered to be allowable.

Claim 9 depends from claims 6, 7 and 8 and is also considered to be allowable as well.

Claims 12 is similar to claim 5 in that it describes the various steps including the materials which are supplied and various times during which the supply occurs. As discussed above, the reference does not teach the supply at the designated periods and accordingly claim 12 is likewise allowable.

Claim 14 describes a light-emitting device composed of Al and GaN including two laminating crystal layers with the first formed from Ga and Al and the second formed from N with the first crystal layer doped with Mg and Si. Applicants submit that this device is also not seen in the references.

Claims 22-24 depend from claim 18 and as such are also considered to be allowable. These dependent claims further describe the second layer as not being doped and how the doping of the first layer occurs at specific times.

Applicants have added new claim 17 which also describes the various materials and the time at which they are supplied, including the specifics of Al, Ga and Mg. Applicants submit that this arrangement is also not seen by the references.

Claims 18 and 19 depend from claim 17 and as such are considered to be allowable. In addition, these claims add the description of the various ratios.

Examiner's Response to Applicants Arguments

The Examiner has indicated that the use of the "deep ultraviolet" is part of the ultraviolet range. Accordingly, Applicants have removed this limitation from the claims.

Conclusion

In view of the above remarks, it is believed that the claims clearly distinguish over the patents relied on by the Examiner, either alone or in combination. In view of this, reconsideration of the rejections and allowance of all the claims are respectively requested.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Robert F. Gnuse Reg. No. 27,295 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Application No. 10/626,661
Amendment dated November 27, 2006
Reply to Office Action of June 27, 2006

Docket No.: 1254-0331PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

Dated: November 27, 2006

Respectfully submitted,

By 

Joe McKinney Muncy

Registration No.: 32,334

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant